

1 March 1968

### THE SOVIET MAN IN SPACE PROGRAM

Manned space flights have been a major factor in the Soviet space program since the launch of Sputnik I on 4 October 1957. The program has enjoyed a high priority and has shown elements of caution in planning and implementation. Through 1965 Soviet manned space efforts were extremely successful and achieved many firsts. Since that time, however, they have not continued at this rapid pace and suffered a serious setback in the death of Cosmonaut Vladimir Komarov in April 1967.

The USSR began to test their manned spacecraft in the spring of 1960. At this time, the Soviets launched the first of a series of unmanned recoverable test vehicles containing first a dummy and then dogs. These flights led to the world's first man in space, Yuri Gagarin in Vostok I in April 1961. This flight was then followed by the 24-hour flight of Gherman Titov in Vostok II in August. The basics were well laid for what was to follow.

The years 1962 and 1963 were those of the dual flights -- two spacecraft in orbit simultaneously. Vostoks III and IV was the first of these flights -- of four and three days duration, respectively. These flights increased Soviet knowledge of the effects of space flight on man as well as investigated problems associated with rendezvous and the control of two spacecraft simultaneously.

Vostoks V and VI increased the length of manned space flight to five days and introduced the world's first woman cosmonaut.

The next phase of the Soviet man in space program was to modify the Vostok as a multi-seated spacecraft and culminated in the launch of Voskhod I in October 1964.

This spacecraft was commanded by Cosmonaut Vladimir Komarov -- the cosmonaut later to be killed during the flight of Soyuz I. Two other passengers were an engineer and a doctor in an apparent attempt to test non-pilots as crew members. During the second and final flight of the Voskhod spacecraft, the Soviets successfully demonstrated the ability to perform extravehicular activities with Aleksey Leonov performing the world's first space walk.

There was then a hiatus of over two years. This time was apparently spent in the development of a new spacecraft, the Soyuz. The first manned flight of this spacecraft was in April 1967 when, with the death of Cosmonaut Komarov, the program suffered its most serious setback to date. The causes of this catastrophe apparently have not as yet been fully resolved. The investigating commission organized at the time of the accident has not as yet made a full public report, and there have been no subsequent manned flights by the USSR.

Although there have been no manned flights since April 1967, the development of space hardware and techniques related to the manned space program continues. In October 1967 the Soviets performed the first unmanned rendezvous and docking using Cosmos 186 and Cosmos 188. The event was a major technological achievement because it was conducted automatically without ground assistance when the vehicles were out of sight of the Soviet Union. The Soviets released pictures of the two spacecraft which showed some features common to earlier manned spacecraft. This suggests that the next phase of the Soviet manned space program will, like the US Gemini program, involve multiple flights and rendezvous and docking. Such a program might culminate in a small space station.

The development of Soviet space hardware usually is hidden from detection until flight tests begin. Thus, a new space booster was revealed for the first time in 1964 when the Soviets orbited the first of three Proton satellites each weighing about 25 thousand pounds. This indicated the existence of a Soviet launch vehicle similar in capability to the US Saturn I. Although Soviet releases of information on the launch vehicle have been

very limited, what little has been said about it can be taken to mean that it may be capable of putting a 40 to 60 thousand pound payload in orbit. This vehicle has several possible roles in the near term Soviet space program including manned circumlunar flights, manned space stations and unmanned exploration of the moon, but it is not large enough to support manned lunar landings.

The Soviets have long indicated an interest in manned lunar landings with the end goal of establishing a manned base on the moon. Most statements about their program was vague and many are contradictory, but there have been some recent indications that the target date for their first manned landing might be four or five years from now. If this is their objective, the Soviets should soon begin to test a space booster even larger than used for the Proton launchings, equivalent to the US Saturn V.

In summary, the Soviet man in space program, which in its early stages was extremely active and aggressive, and as such accomplished many "firsts", has now slowed perceptibly. This slowdown was no doubt due first to the time needed for the development of a new Soyuz spacecraft and then prolonged by the death of Komarov. It has also probably partly been due to the increasing complexity of mission objectives.

Vostok I	Yuri Gagarin	12 April 1961
Vostok II	Gherman Titov	6-7 August 1961
Vostok III	Andrian Nikolayev	11-15 August 1962
Vostok IV	Pavel Popovich	12-15 August 1962
Vostok V	Valeriy Bykovski	14-19 June 1963
Vostok VI	Valentina Tereskova	16-19 June 1963
Voskhod I	Vladimir Komarov	12-13 October 1964
	Konstantin Feoktistov	
	Boris Yegorov	
Voskhod II	Pavel Belyayev	18-19 March 1965
	Aleksey Leonov	
Soyuz I	Vladimir Komarov	23-24 April 1967

*Statement addition NS+A*

Approved For Release 2004/02/09 : CIA-RDP70B00338R000200130022-8

On the other hand, the increased space launch activity by the Soviets during the month of April may be the prelude to an active manned space program. Specifically, the second successful rendezvous and docking of the two unmanned space ships on April \_\_ may encourage the Soviets to a manned rendezvous and docking mission in the forthcoming months.

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